The drawings filed on February 15, 2002 have been accepted by the Examiner.

REMARKS

The Examiner has indicated that the above application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. To overcome this objection, limitations have been added to the specification as suggested by the Examiner.

All formal matters having been addressed, the application is in condition for allowance and this action is requested.

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Respectfully submitted,

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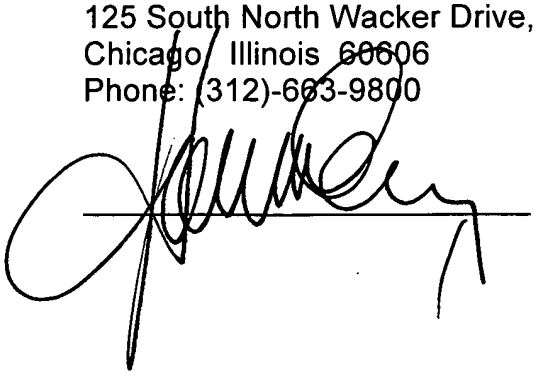

This invention pertains to lithium batteries or cells of the type set forth in which the anode or negative electrode includes or consists of a crystalline graphite or lithium metal or lithium alloy and an electrolyte of a salt such as lithium hexaflurophosphate dissolved in an organic solvent consisting of two or more aprotic constituents, one of which may be propylene carbonate as well as a positive electrode such as a lithium metal oxide. Propylene carbonate (PC) based solvents normally cause exfoliation of a graphite negative electrode resulting in the degradation of its electrochemical properties. Propylene carbonate, however, is an excellent solvent for use in lithium ion cells in that it permits cell operation to cross a broad temperature range with graphite based negative electrodes, which provide excellent power characteristics.

SUMMARY OF THE INVENTION

Non-aqueous rechargeable lithium batteries can be safe against thermal runaway by incorporating small amounts of suitable additive materials into the electrolyte. Flame retardant additives maybe selected from a blend of organic phosphates and carbonate compounds, such as triphenyl phosphate and/or phenyl alkyl phosphate and aryl/alkylphosphate, and vinyl ethylene carbonate or a cyclic ethyl carbonate, $C_2, H_4 CO_3$, and derivatives thereof, where the 1 to 4 hydrogen groups are replaced with a C1-C6 alkane or from single additives can provide superior thermal safety behavior at the fully charged state in high voltage lithium ion batteries. Some of these compounds can also be used as degassing additives in lithium rechargeable batteries by preventing gas generation at extremely high temperature storage. Preferably, these additive compounds are soluble in the electrolyte.

Propylene carbonate based solvents can be utilized in lithium ion batteries provided that an additive is used in the electrolyte which forms a surface coating on the graphite particles of the

negative electrode (anode) that prevents the propylene carbonate solvent from entering the crystal lattice of the graphite thereby preventing exfoliation of the graphite material with the resulting degradation of its electrochemical properties as a negative electrode. Anode passivating materials